

**ELECTRIC SPINDLE MOTOR AND METHOD HAVING MAGNETIC  
STARTING/STOPPING DEVICE**

**ABSTRACT**

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A high precision spindle suitable for hard disk drives, optical disk drives, such as DVDs, CD drives, and other applications includes a hub, a hybrid hydrodynamic an aerodynamic bearing system, a brushless motor, a starting/stopping assistant device and a base. The hybrid fluid film bearing system

10 ensures that the spindle works at high precision, low acoustic noise and low power consumption. The starting/stopping assistant device lifts the rotating portion of the spindle and its load by means of magnetic force, hence, reduces the friction between the contacted surfaces of thrust air bearing. It reduces the starting/stopping time and lessens the wear of bearing, therefore, effectively  
15 suppresses the contamination caused by wear particles. Magnetic seals are also provide to prevent journal bearing fluid from leaking.

(Figure 1)